FEBRUARY 1975
No. 2

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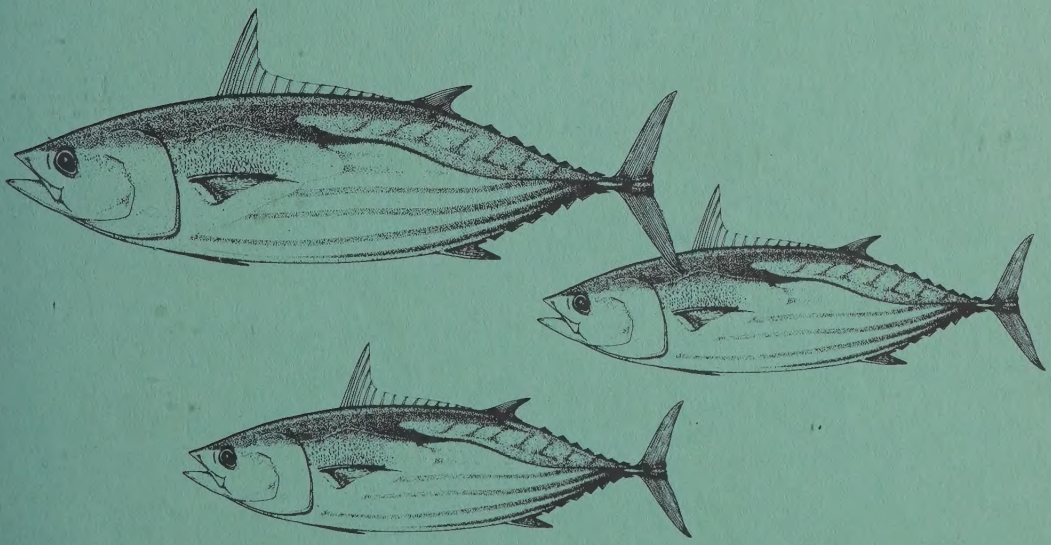
Southwest Fisheries Center-La Jolla, California



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U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
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FEBRUARY 1975, No. 2

B. J. Rothschild, Director, SOUTHWEST FISHERIES CENTER
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PREFACE

This publication, Fishing Information, appears monthly and contains 1) fishery advisory information, 2) a narrative description of pertinent surface temperature conditions, 3) a narrative description of subsurface temperature structure for parts of the North Pacific, 4) charts of winds and pressures for the eastern North Pacific, 5) charts of sea surface temperature for the North Pacific and eastern tropical Pacific, and 6) charts of subsurface temperature structure in the eastern North Pacific.

A supplement to Fishing Information appears at 15-day intervals throughout the year. This is a chart of sea surface temperature (contoured at 2°F (1°C) intervals) from Baja California to Vancouver Island out to about 135°W. Special bulletins are published in conjunction with the 15-day sea surface temperature charts which include short-term projections of albacore distribution and locations of productive fishing areas, information on oceanographic and atmospheric conditions, and other information as is appropriate during the albacore fishing season.

L.E. Eber, Leader
Fishery Information Systems
Southwest Fisheries Center
La Jolla, California

The Secretary of Commerce has determined that the publication of this periodical is necessary in the transaction of the public business required by law of this Department. Use of funds for printing this publication approved by the Office of Management and Budget, August 20, 1973; this approval expires June 1976.

Submitted for publication - March 24, 1975

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L. Eber (Figures 4 and 6)
F. Miller (Figures 8 and 9)
J. Renner (Figures 1,2,3,5,7,10, 11, 12 and 15-day Supplement)

TECHNICAL EDITOR:
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R. Allen

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Pacific Environmental Institute, Fisheries Research Board of Canada, West Vancouver, British Columbia, by L.F. Giovando from observations by S.G. Westhaver at Langara Island Light; D.L. Kupillas at Cape St. James Light; L. Collins at Kains Island Lightstation; J.G. McNeil at Amphitrite Point Light.
Scripps Institution of Oceanography, La Jolla, California
Fishing Vessels, Bold Contender, Cabrillo, Captain Joe Medina, Carol S., Carol Virginia, Cheryl Marie, Christina C., Conquest, Elsinore, Frances Ann, Gina Karen, Independence, Jennette C., Jo Linda, Larry Roe, Lucky Strike, Marco Polo, Maria C.J., Maria Elena, Marietta, Mary Barbara, Mermaid, Pan Pacific, Patricia Lee, Queen Mary, Raefello, San Juan (W17714), San Juan (WX8016), Santa Rosa, Saratoga, Sea Treasure, Seaquest, Theresa Ann, Trinidad, United States, Venturous, Willa G.

Expendable bathythermograph and salinity observations are made by the mates and engineers of the Monterey of Pacific Far East Line and the Californian of Matson Navigation Co. The data are processed under supervision of D.R.McLain at the NMFS Pacific Environmental Group, Monterey, using computer facilities of the Fleet Numerical Weather Center. The project is partially supported by the National Science Foundation and the Office of Naval Research under Government NAonr-9-74.

Sea Surface Temperature and Environmental Conditions

L. EBER AND F. MILLER

Eastern North Pacific

Seasonal cooling from January to February 1975 was generally greater than normal in all portions of the eastern north Pacific (ENP), except in the region west of 155°W and north of 35°N. Negative deviations of sea surface temperature in the Gulf of Alaska and along the west coast of North America spread seaward, while positive deviations between 25° and 40°N were diminished in magnitude or changed to negative (Figure 5). In the northwest portions of the ENP, where seasonal cooling was less than normal, negative deviations were diminished or changed to positive. Consequently, there was an overall tendency toward average temperature conditions except in the region between Baja California and Hawaii.

Two distinct atmospheric circulation regimes occurred over the ENP during February 1975. The first part of the month was characterized by a dominant cyclonic circulation system centered in the vicinity of 40° to 45°N, at 135°W. The eastern North Pacific high pressure cell was subsequently re-established between 130° and 145°W at 35°N and the principal center of cyclonic activity was shifted to the western part of the Gulf of Alaska. The contrasting circulation patterns resulted in below normal pressures for the month, off the northwestern states out to 140°W, and above normal pressures in the vicinity of Kodiak Island and the Alaska Peninsula (Figures 1 and 2). The associated anomalous resultant wind pattern is therefore variable and not readily correlated with observed changes in the sea surface temperatures.

Western North Pacific

Sea surface temperature conditions in the region 30° to 50°N remained much the same in February 1975 as in the previous month. A pool of warm water persisted in the area between 35° and 40°N, 150° to 155°E (Figure 6), with positive deviations of 2°F (1.1°C). Elsewhere, the deviations from normal were mostly negative, exceeding 2°F (1.1°C) in a few scattered areas. Negative deviations also spread south of 30°N into some areas where conditions had been mostly warmer than normal a month earlier.

Eastern Tropical Pacific

In the northern hemisphere changes in sea surface temperature are very small between 5° and 30°N from January to February. The largest seasonal increases of 2° to 3°F (1.1° to 1.6°C) take place along the western edge of the Peru current out to 115°W between 5°N and 20°S. The north-south temperature gradient in the equatorial front between Ecuador and the Galapagos Islands is weaker in February than in any other month.

The weak equatorial front in February 1975 is no exception to the normal situation (Figure 8). In fact, the sea surface temperatures in the southern hemisphere east of 110°W are very close to normal with only small positive anomalies showing up on the western edge of the Peru current. In the Peru current region, surface temperatures appear to be slightly below normal near the coast (Figure 9) based on only scattered ship reports and no coastal station data. Between 85° and 95°W there has been a gradual warming trend over the past several months. In February 1974 temperatures were 2° to 4°F (1.1° to 2.2°C) below normal in this equatorial area where positive anomalies are found in 1975. Another area showing a warming trend since late November 1974 is west of 130°W from the equator to 15°S. The warm anomaly pattern in February (Figure 9) extends northward across the equator between 165° and 175°W to about 25°N where it spreads out over the Central Pacific.

Over most of the eastern tropical Pacific, a gradual warming has taken place over the past 2 months, particularly in the equatorial area from 5°N to 5°S. The one exception to this warming trend has occurred south and west of Baja California where negative temperature anomalies (Figure 9) of 2° to 4°F (1.1° to 2.2°C) have persisted for over a year.

Subsurface Temperature Structure in the Northeast Pacific Ocean

J. F. T. SAUR*

Subsurface temperature sections are presented in this issue for three routes between U.S. west coast ports and Hawaii. Observations were taken during the last week in January and first week in February.

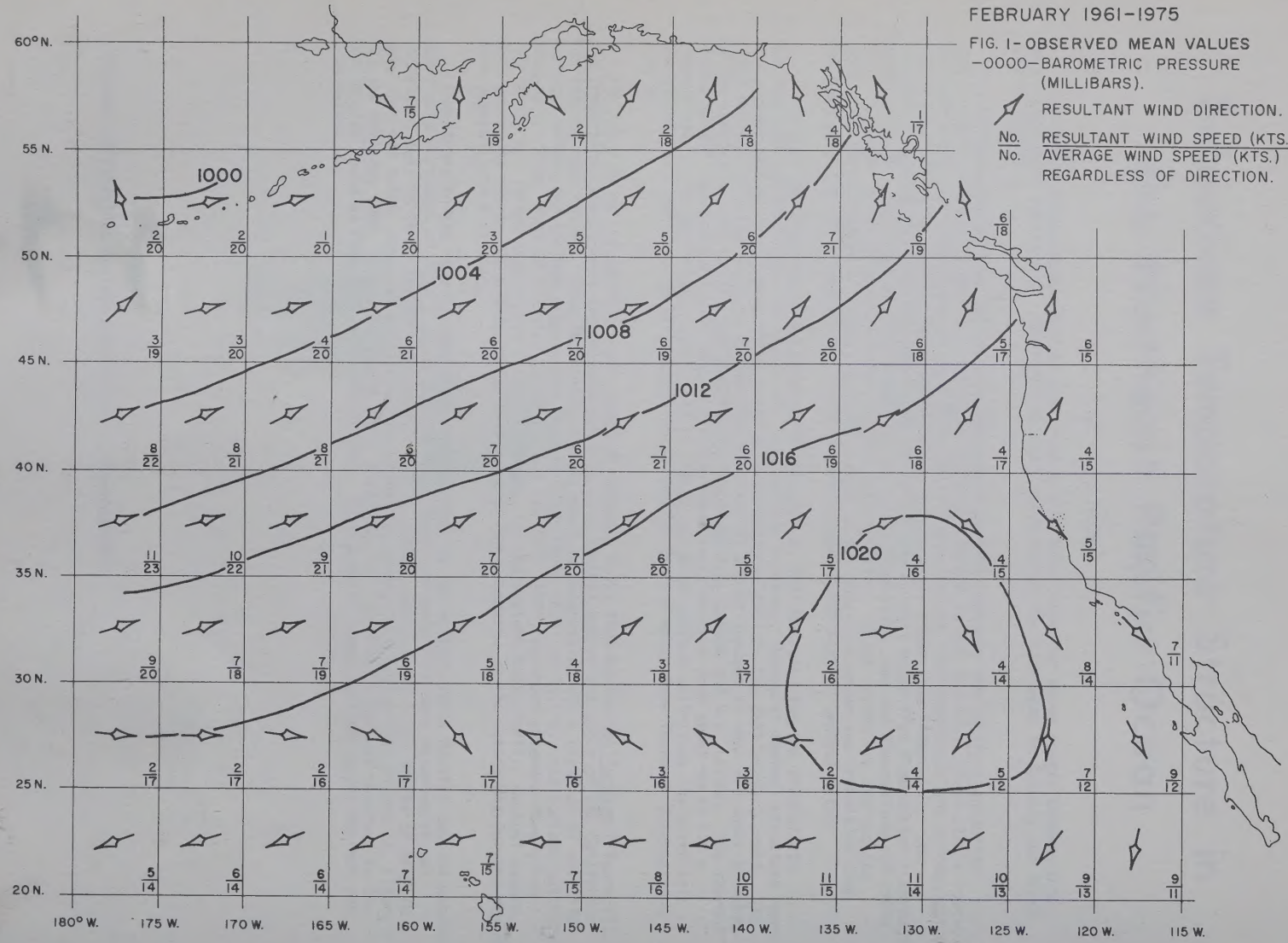
A Portland to Honolulu section was obtained from data taken by the Californian during January 20-31, 1975 (Figure 10). Note that the ship did not follow the usual great circle route, but headed SSW out of Portland to near 35°W (Obs.14) and then SW into Honolulu along a track which nearly coincides with the San Francisco-Honolulu great circle route (see Figure 11). Low salinities marking the Subarctic waters of the California Current occur from Observation 1 through Observation 10. Observation 11-15 appear to be in the Transition Zone and Observations 16 (34°N, 137°W) through 35 in the eastern North Pacific Central water. Mixed layers are approaching maximum winter-time depths. They are 60-80 m deep in the Subarctic water and Transition Zone but generally 110-130 m deep in the region of the eastern North Pacific Central water.

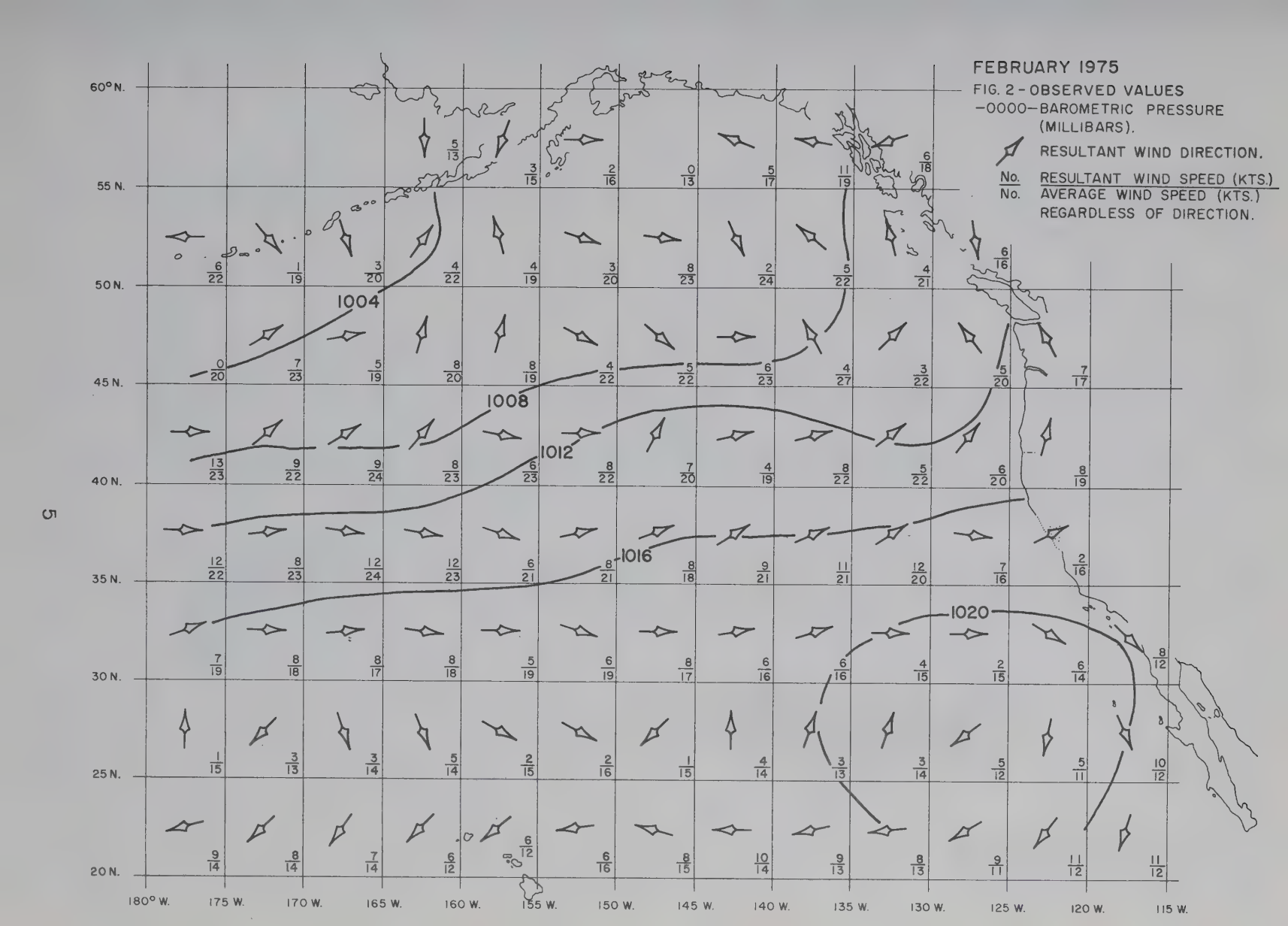
Data from the Monterey taken January 30-February 3, 1975 was used for the Honolulu to San Francisco section shown in Figure 11. Low surface salinity, irregular thermal structure near the surface and shallow thermoclines occur at Observations 22-24 in the California Current. The steep surface salinity gradient between Observations 21 and 22 appears to mark the outer boundary of the current -- also called the "California Front" by E.C. LaFond and K.G. LaFond. The thermoclines deepen westward (Obs. 21 to Obs. 17) in the Transition Zone from about 90 to 110 m respectively. The deep mixed layers (110 to 120 m) and high surface salinities characteristic of the wintertime conditions in the eastern North Pacific Central water were found at Observations 1 to 16.

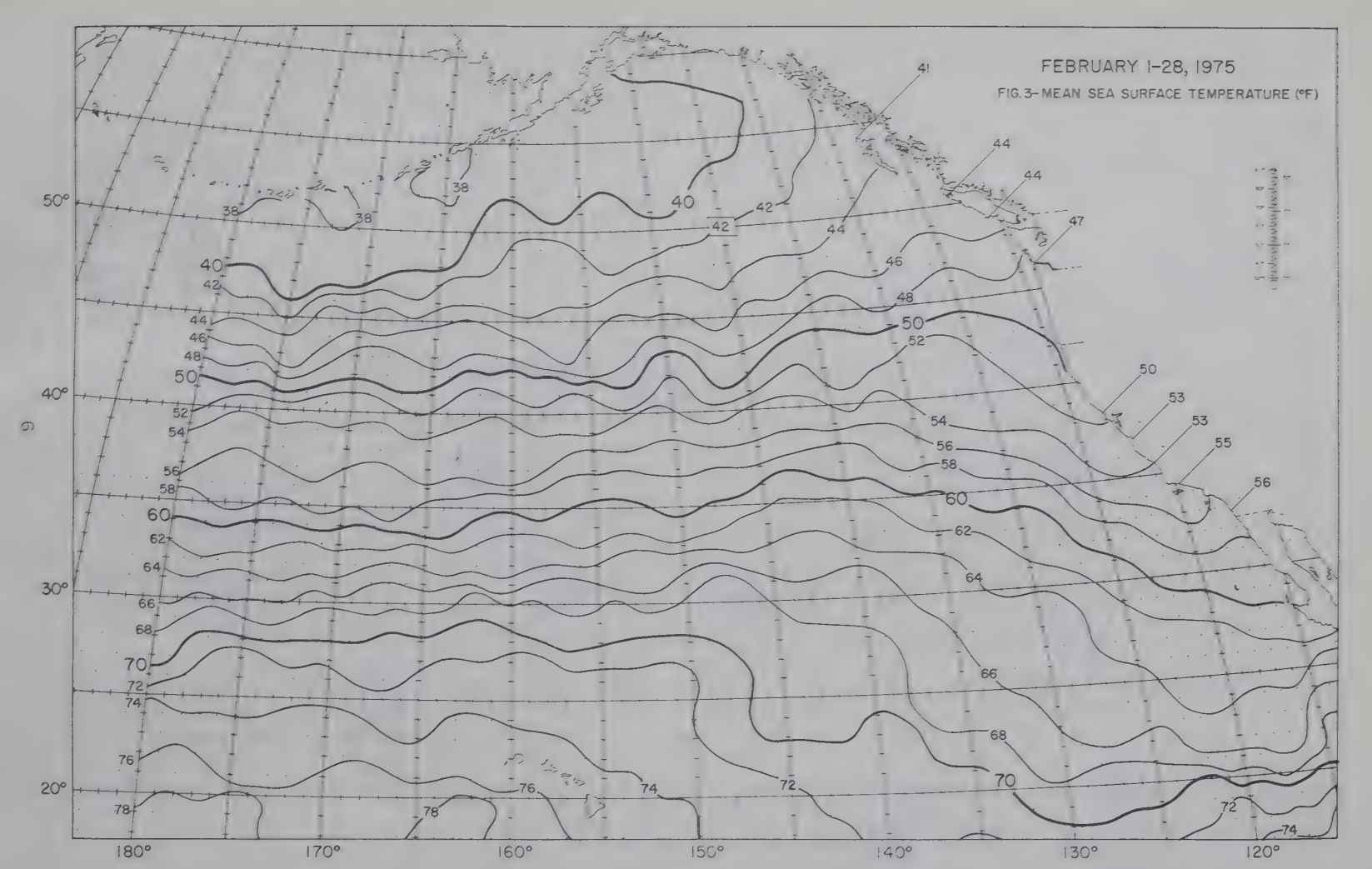
On the Hilo to Los Angeles route traveled February 5-10, 1975 by the Californian (Figure 12), the Transition Zone between the eastern North Pacific Central waters and those of the California Current was very narrow. From Observation 56 eastward to Observation 60, a distance of only 130 nautical miles, the surface temperature dropped 2.2°C (from 18.1° to 15.9°C), the surface salinity dropped 1.3 °/oo (from 34.9°/oo to 33.6°/oo) and the 15°C (59°F) isotherm ascended 90 m (from 183 to 92 m). Mixed layers west of this boundary, in the eastern North Pacific Central waters, were generally 110 to 140 m deep while those east of the boundary, in the California Current region, were generally 95 m or less.

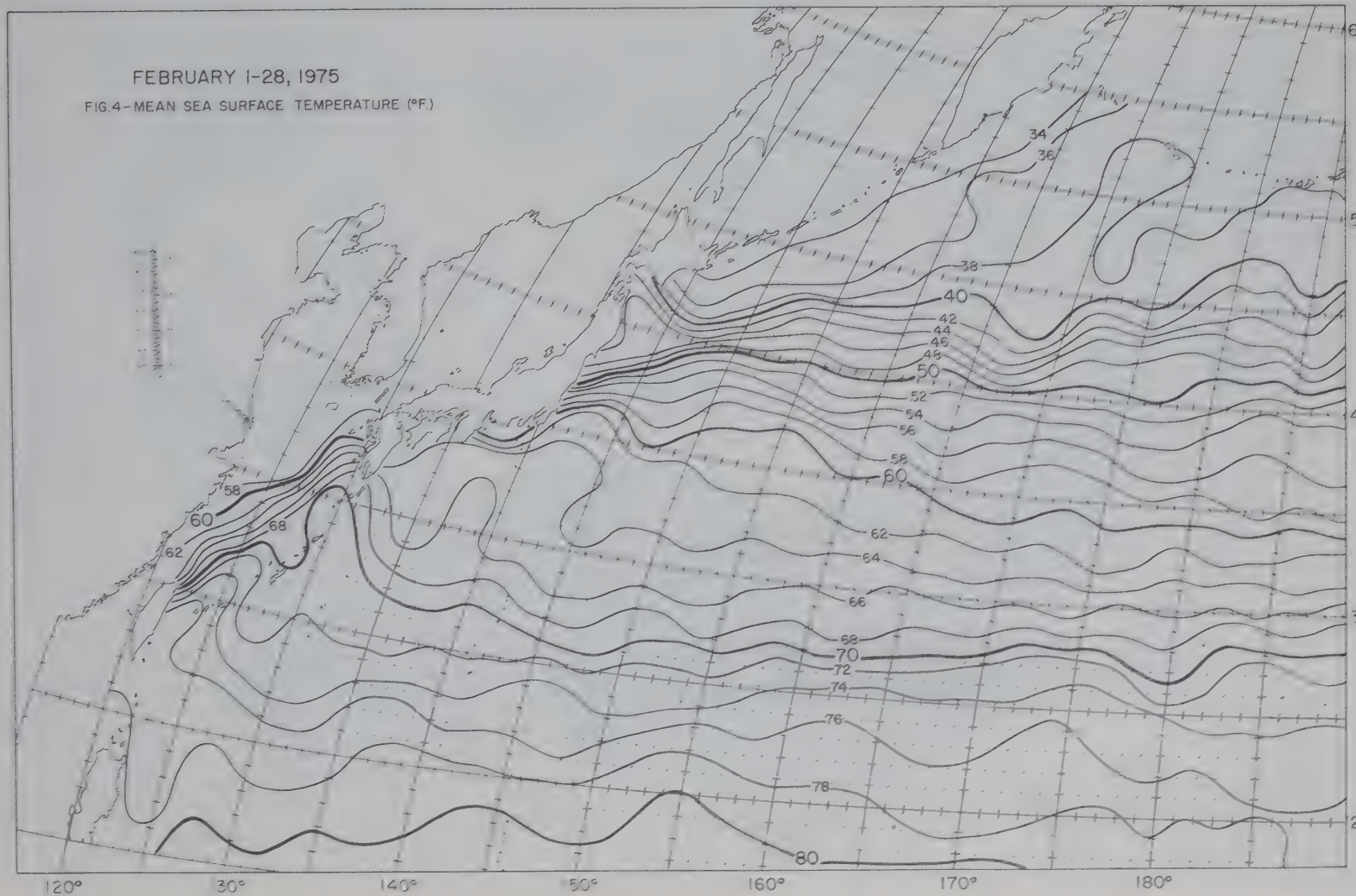
Exceptions to the rule of deep mixed layer depths in the eastern North Pacific Central waters were found northeast of Hawaii where shallow mixed layers of only 75 m were reported at two locations: near 28°26'N, 145°30'W and near 26°30'N, 149°W. Here, mixed layer depths of only 75 m were observed twice, about 48 hours apart by different ships, Californian (Obs.24 and 27, Figure 10) and Monterey (Obs. 10 and 7, Figure 11). A similar shallow mixed layer was observed on the Los Angeles route at Observation 47 (Figure 12). The cause of these shallow layers has not yet been determined.

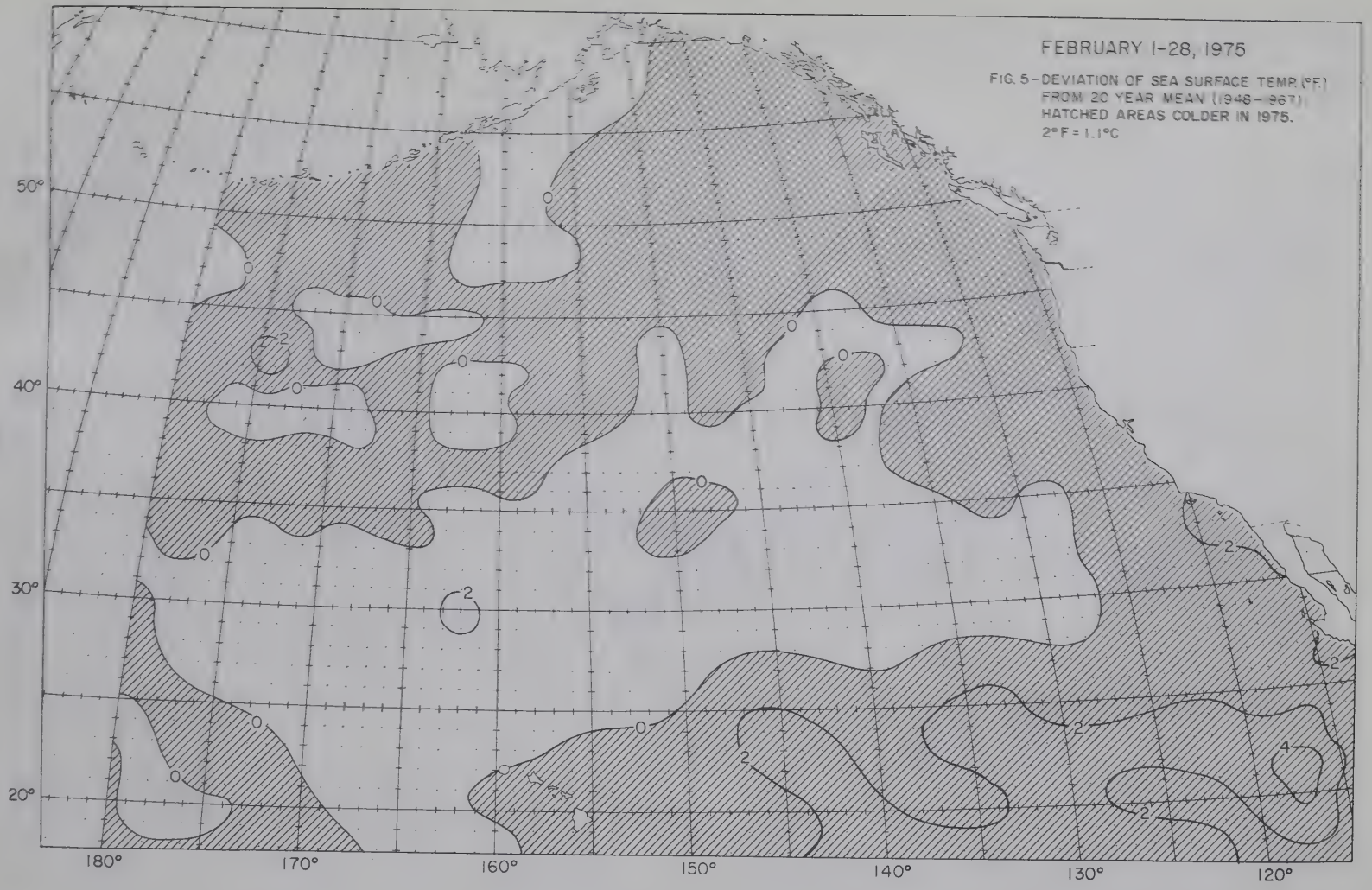
* Present affiliation: Scripps Institution of Oceanography

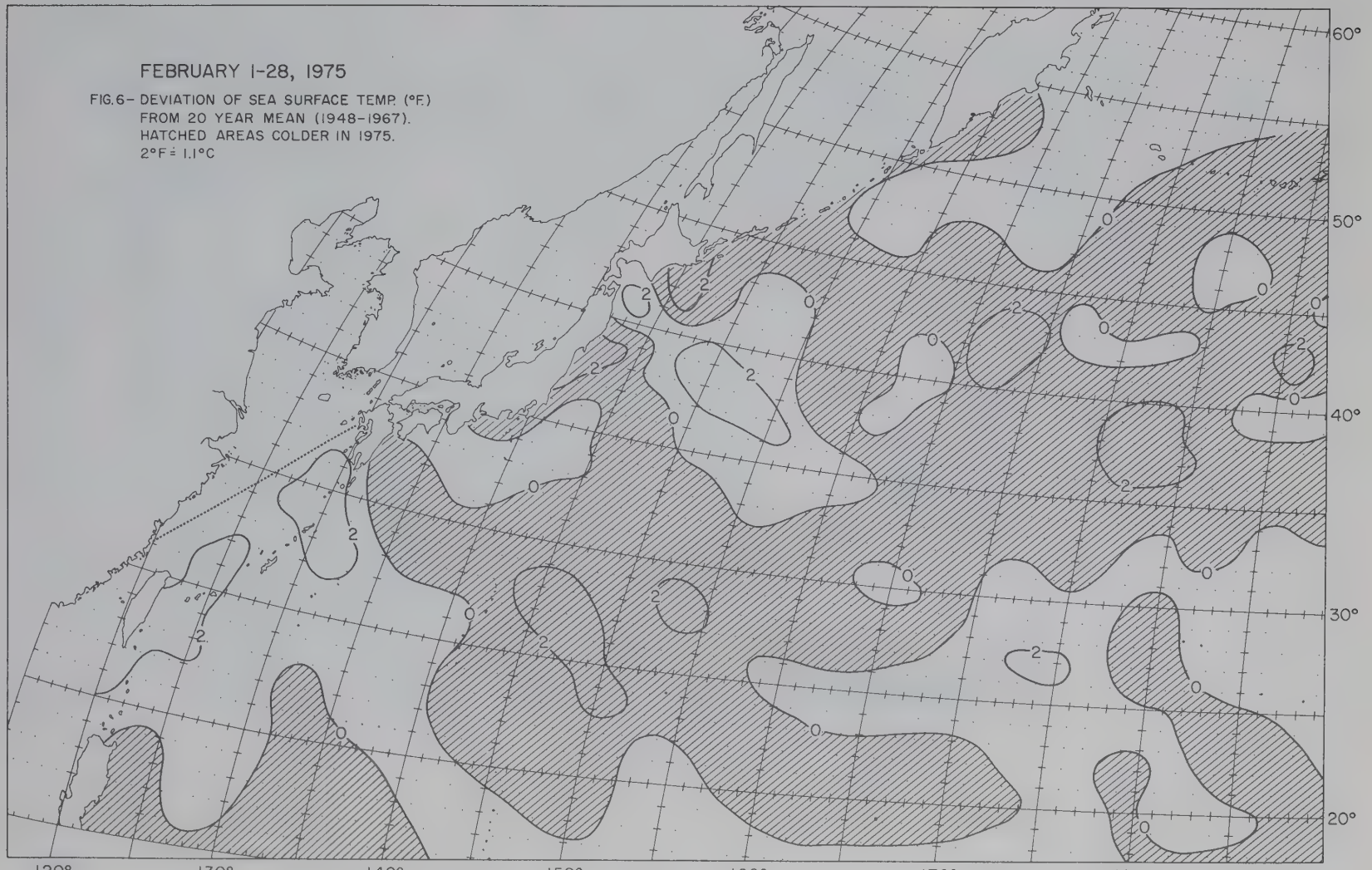

FEBRUARY 1961-1975
FIG. 1- OBSERVED MEAN VALUES
-0000- BAROMETRIC PRESSURE (MILLIBARS).
RESULTANT WIND DIRECTION.
No. RESULTANT WIND SPEED (KTS.)
No. AVERAGE WIND SPEED (KTS.) REGARDLESS OF DIRECTION.
1000
1004
1008
1012
1016
1020
60° N.
55 N.
50 N.
45 N.
40 N.
35 N.
30 N.
25 N.
20 N.
180° W.
175 W.
170 W.
165 W.
160 W.
155 W.
150 W.
145 W.
140 W.
135 W.
130 W.
125 W.
120 W.
115 W.

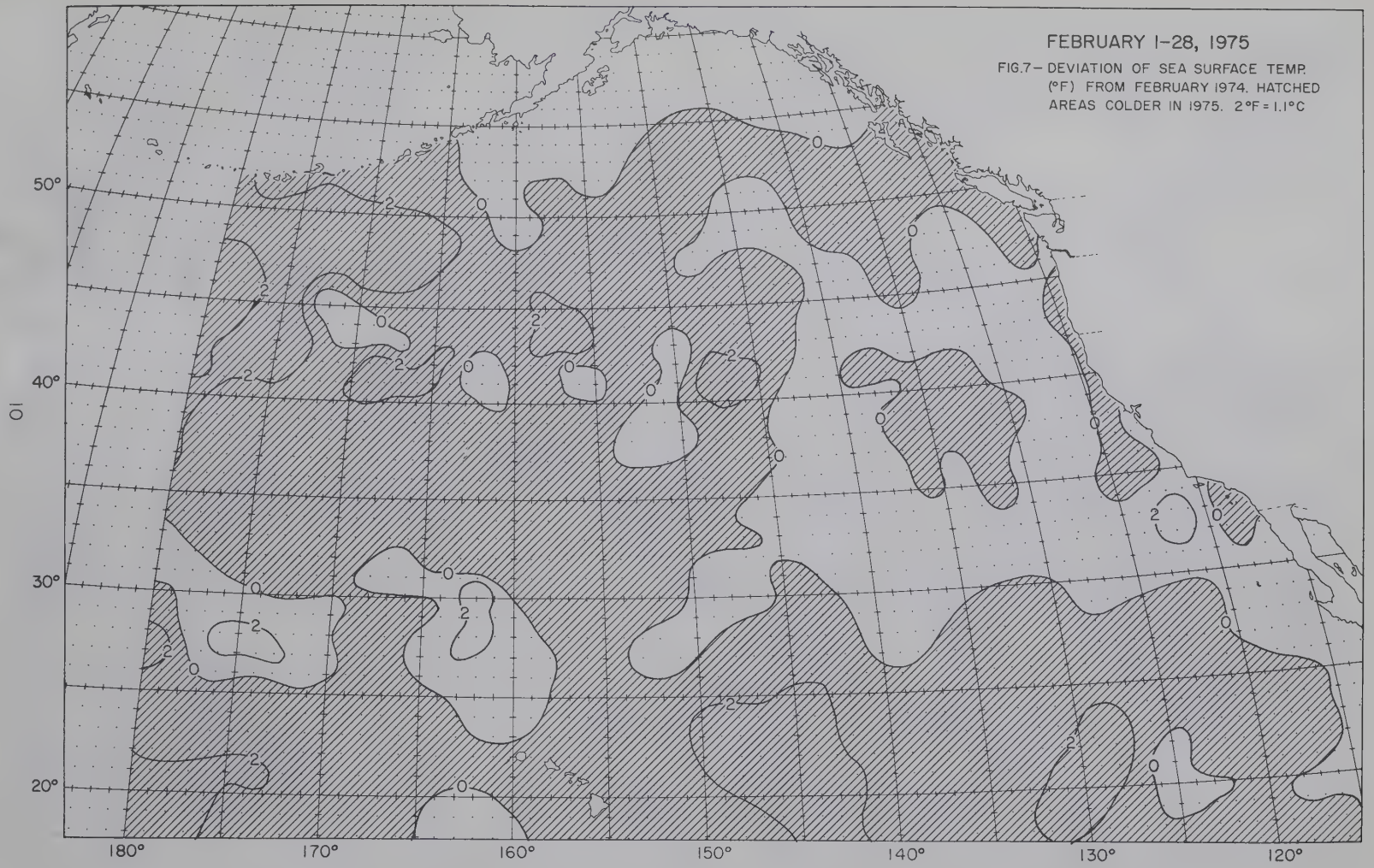

FEBRUARY 1975
FIG. 2 - OBSERVED VALUES
-0000- BAROMETRIC PRESSURE (MILLIBARS).
RESULTANT WIND DIRECTION.
No. RESULTANT WIND SPEED (KTS.)
No. AVERAGE WIND SPEED (KTS.) REGARDLESS OF DIRECTION.
1004
1008
1012
1016
1020
60° N.
55 N.
50 N.
45 N.
40 N.
35 N.
30 N.
25 N.
20 N.
180° W.
175 W.
170 W.
165 W.
160 W.
155 W.
150 W.
145 W.
140 W.
135 W.
130 W.
125 W.
120 W.
115 W.

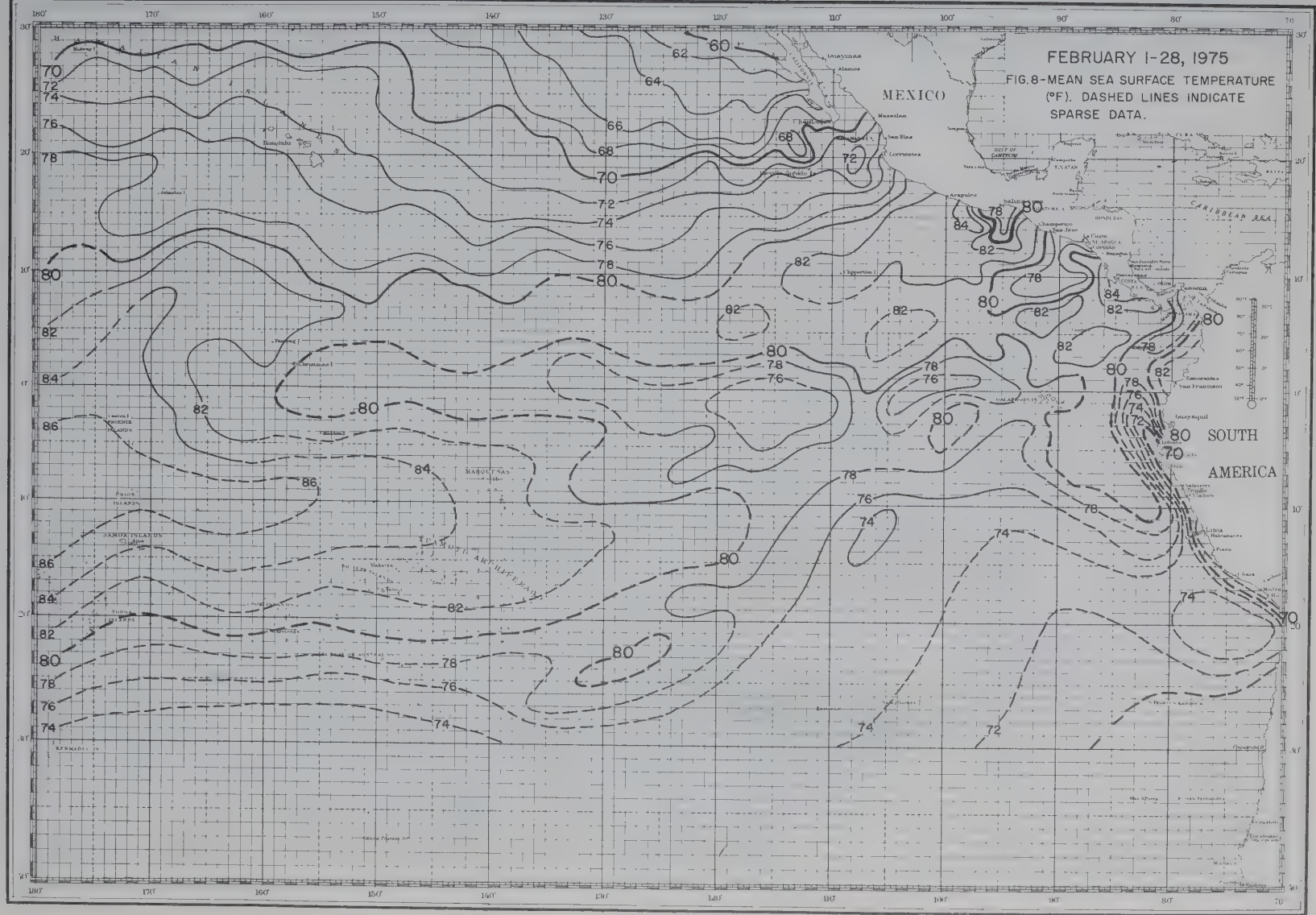

FEBRUARY 1-28, 1975
FIG. 3-MEAN SEA SURFACE TEMPERATURE (°F)
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°


FEBRUARY 1-28, 1975
FIG.4-MEAN SEA SURFACE TEMPERATURE (°F.)
34
36
38
40
42
44
46
48
50
52
54
56
58
60
62
64
66
68
70
72
74
76
78
80
60°
50°
40°
30°
20°
120°
130°
140°
150°
160°
170°
180°


FEBRUARY 1-28, 1975
FIG. 5-DEVIATION OF SEA SURFACE TEMP.(°F.) FROM 20 YEAR MEAN (1948-967) HATCHED AREAS COLDER IN 1975.
2°F = 1.1°C
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°
0
2
4


FEBRUARY 1-28, 1975
FIG. 6- DEVIATION OF SEA SURFACE TEMP. (°F.) FROM 20 YEAR MEAN (1948-1967). HATCHED AREAS COLDER IN 1975. 2°F ≐ 1.1°C
60°
50°
40°
30°
20°
120°
130°
140°
150°
160°
170°
180°


FEBRUARY 1-28, 1975
FIG.7- DEVIATION OF SEA SURFACE TEMP. (°F) FROM FEBRUARY 1974. HATCHED AREAS COLDER IN 1975. 2°F = 1.1°C
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°


FEBRUARY 1-28, 1975
FIG.8-MEAN SEA SURFACE TEMPERATURE (°F). DASHED LINES INDICATE SPARSE DATA.
MEXICO
SOUTH AMERICA
CARIBBEAN SEA
HONDURAS
GULF OF CAMPECHE
YUCATAN
GALAPAGOS ISLANDS
PHOENIX ISLANDS
SAMOA ISLANDS
MARQUESAS
TUAMOTU ARCHIPELAGO
BERMUDA IS.
Acapulco
Manzanillo
San Blas
Corrientes
Puerto Angel
San Jose
Guayaquil
San Francisco
Lima
Callao
Paita
Tahiti
Papeete
Honolulu
Johnston I.
Palmyra I.
Jarvis I.
Canton I.
Enderbury I.
Christmas I.
Fanning I.
Washington I.
Tutuila I.
Upolu I.
Savaii I.
Nukuhiva
Hiva Oa
Rapa
Mururoa
Tubuai
Rurutu
Raivavae
Pitcairn I.
Easter I.
Juan Fernandez Is.
Mas Afuera
Mas a Tierra
Tres Marias Is.
Revillagigedo Is.
Socorro I.
Clarion I.
Roca Partida
Isla Isabel
Islas Tres Marias
Islas Revillagigedo
Islas Galapagos
Islas Juan Fernandez
Islas Marquesas
Islas Tuamotu
Islas Samoa
Islas Phoenix
Islas Bermuda
Islas Caribe
Islas Honduras
Golfo de Tehuantepec
Golfo de Panama
Golfo de Guayaquil
Golfo de Fonseca
Golfo de Nicoya
Golfo de Dulce
Golfo de Campeche
Golfo de Mexico
Golfo de Honduras
Golfo de Paria
Golfo de Venezuela
Golfo de Maracaibo
Golfo de Uraba
Golfo de Darien
Golfo de San Miguel
Golfo de Montijo
Golfo de Chiriqui
Golfo de Papagayo
Golfo de Tehuantepec
Golfo de Panama
Golfo de Guayaquil
Golfo de Fonseca
Golfo de Nicoya
Golfo de Dulce
Golfo de Campeche
Golfo de Mexico
Golfo de Honduras
Golfo de Paria
Golfo de Venezuela
Golfo de Maracaibo
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Golfo de Chiriqui
Golfo de Papagayo

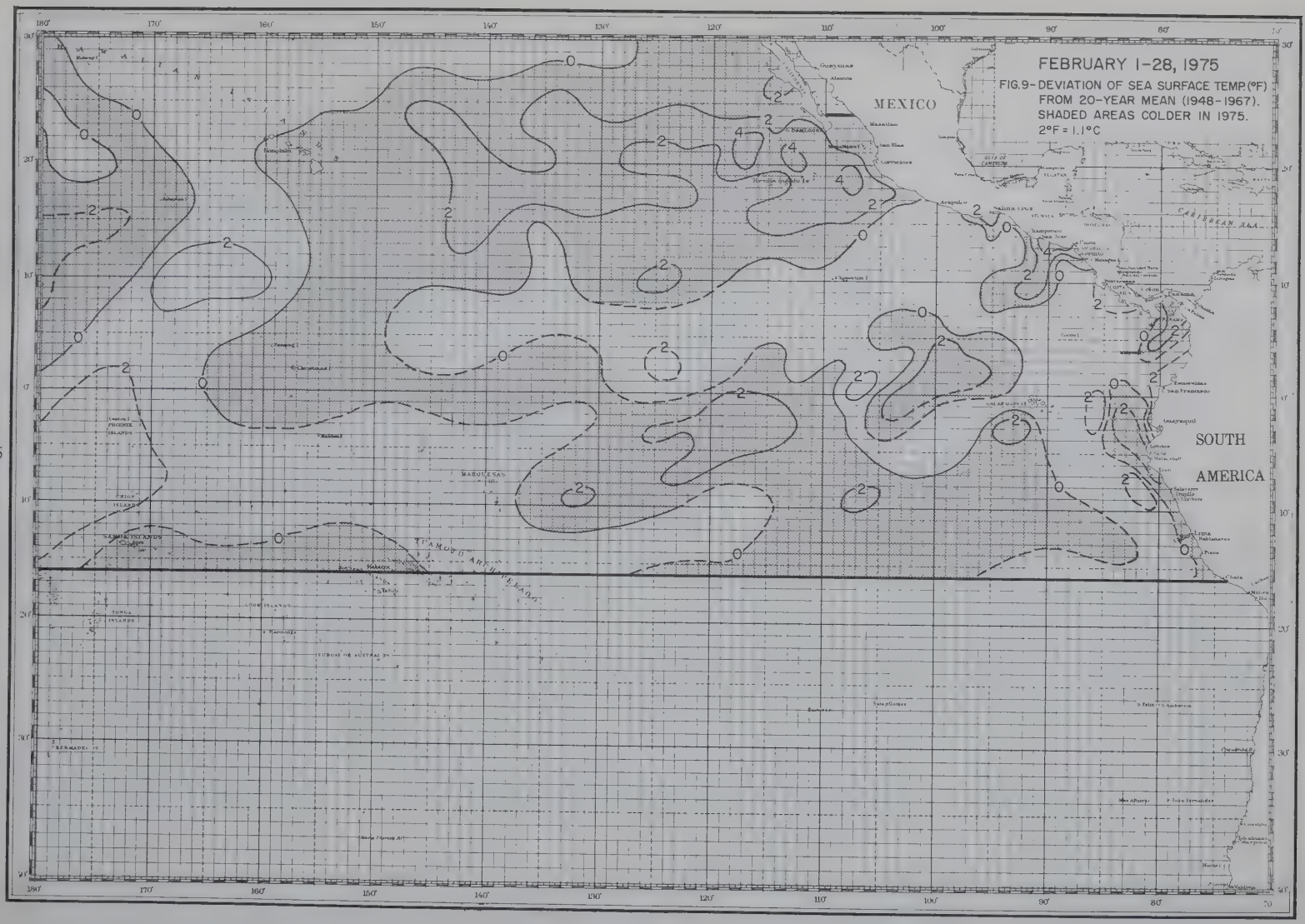
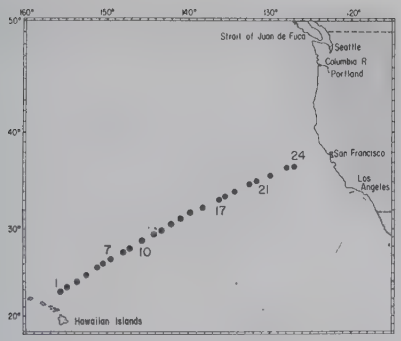
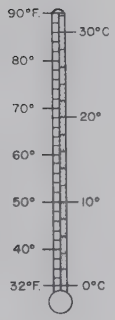

FEBRUARY 1-28, 1975
FIG.9- DEVIATION OF SEA SURFACE TEMP.(°F) FROM 20-YEAR MEAN (1948-1967). SHADED AREAS COLDER IN 1975.
2°F = 1.1°C
MEXICO
SOUTH AMERICA
CARIBBEAN SEA
MARQUESAS
TUAMOTU ARCHIPELAGO
TONGA ISLANDS
COOK ISLANDS
180°
170°
160°
150°
140°
130°
120°
110°
100°
90°
80°
70°
30°
20°
10°
0°

FIGURE 10





HONOLULU – SAN FRANCISCO

JAN. 30– FEB. 3 , 1975

MONTEREY

VOYAGE 63

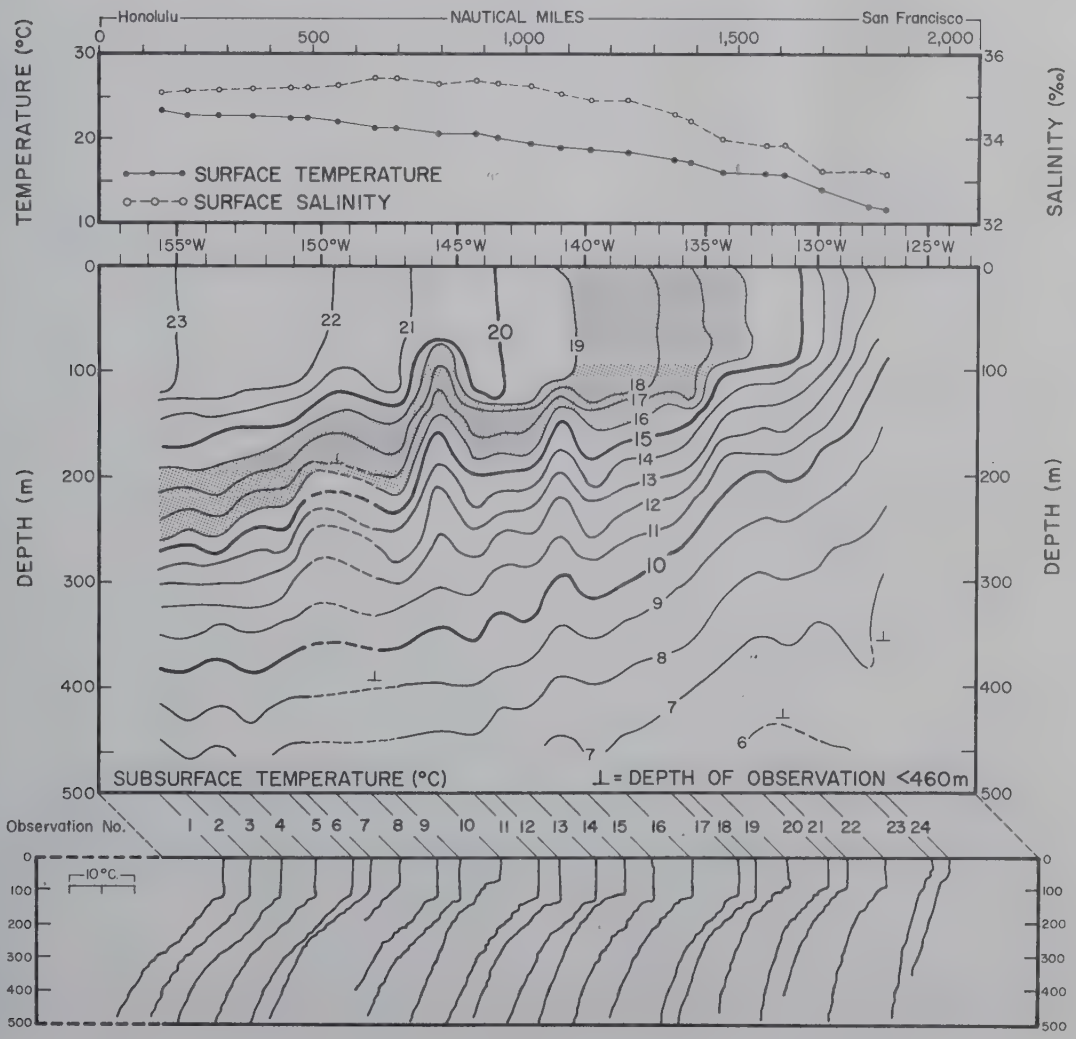
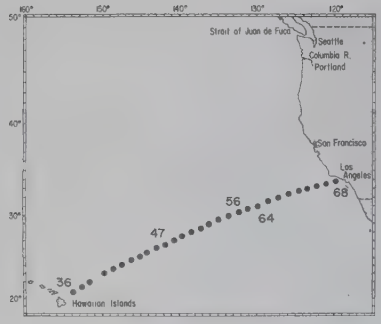
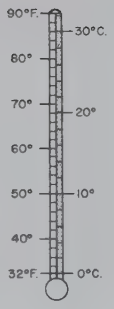


FIGURE 11





HILO – LOS ANGELES

FEBRUARY 5–10, 1975

CALIFORNIAN

VOYAGE 252

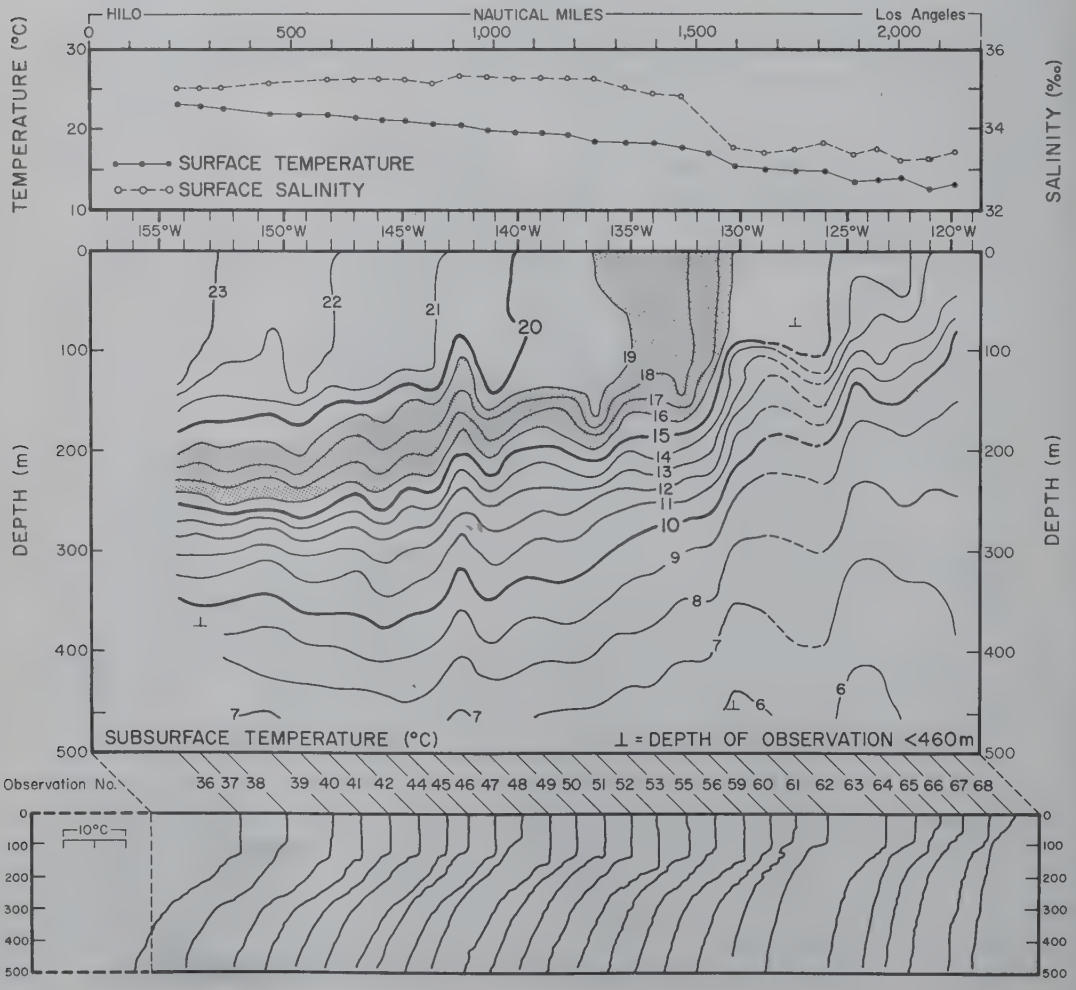
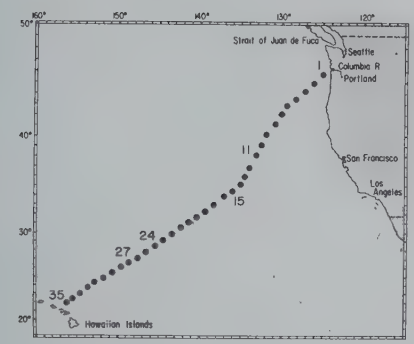
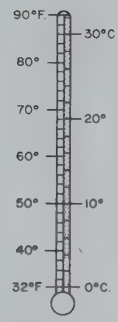


FIGURE 12



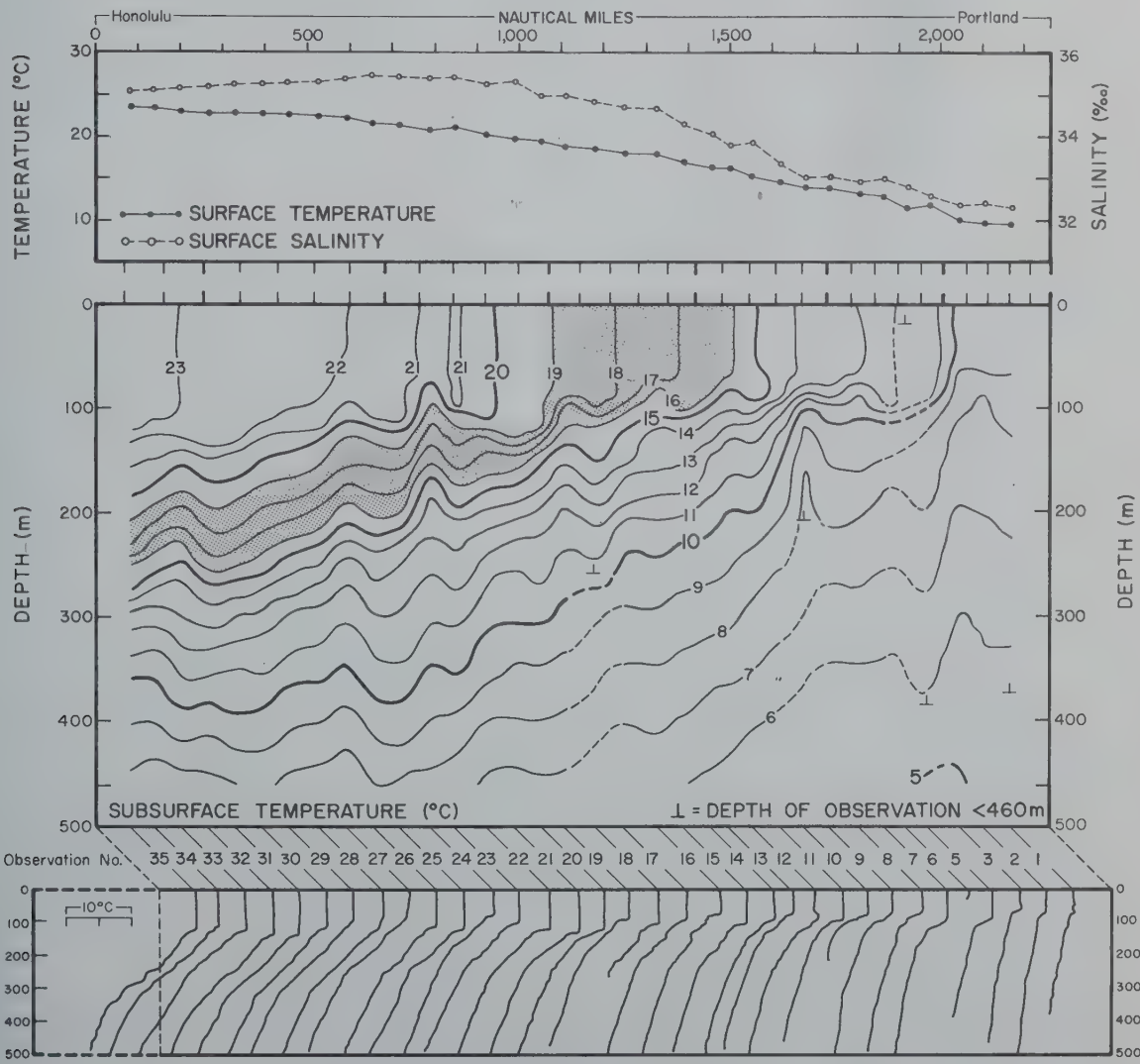


HONOLULU — PORTLAND
(Makapuu Pt. — Columbia River)

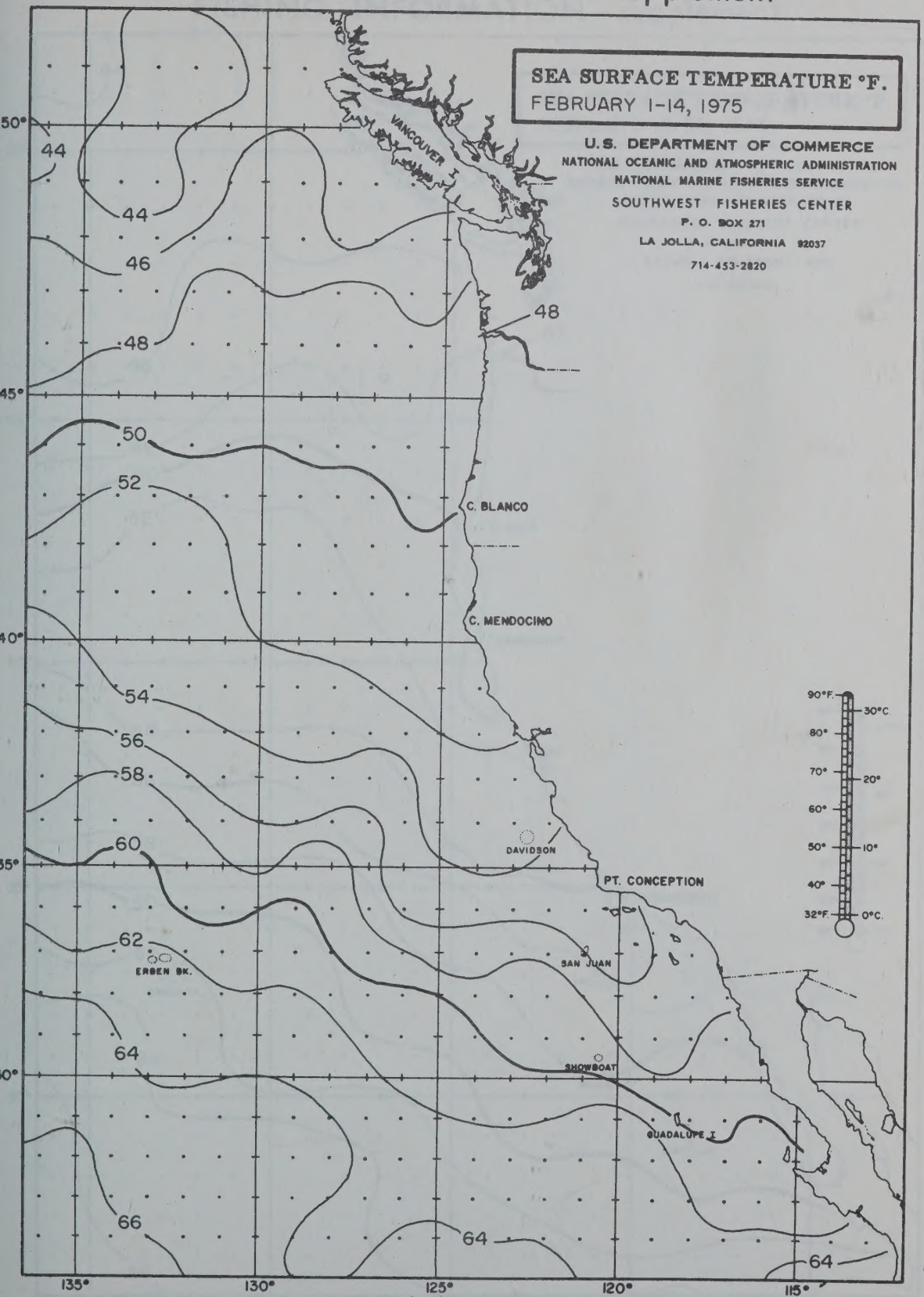
JANUARY 26–31, 1975

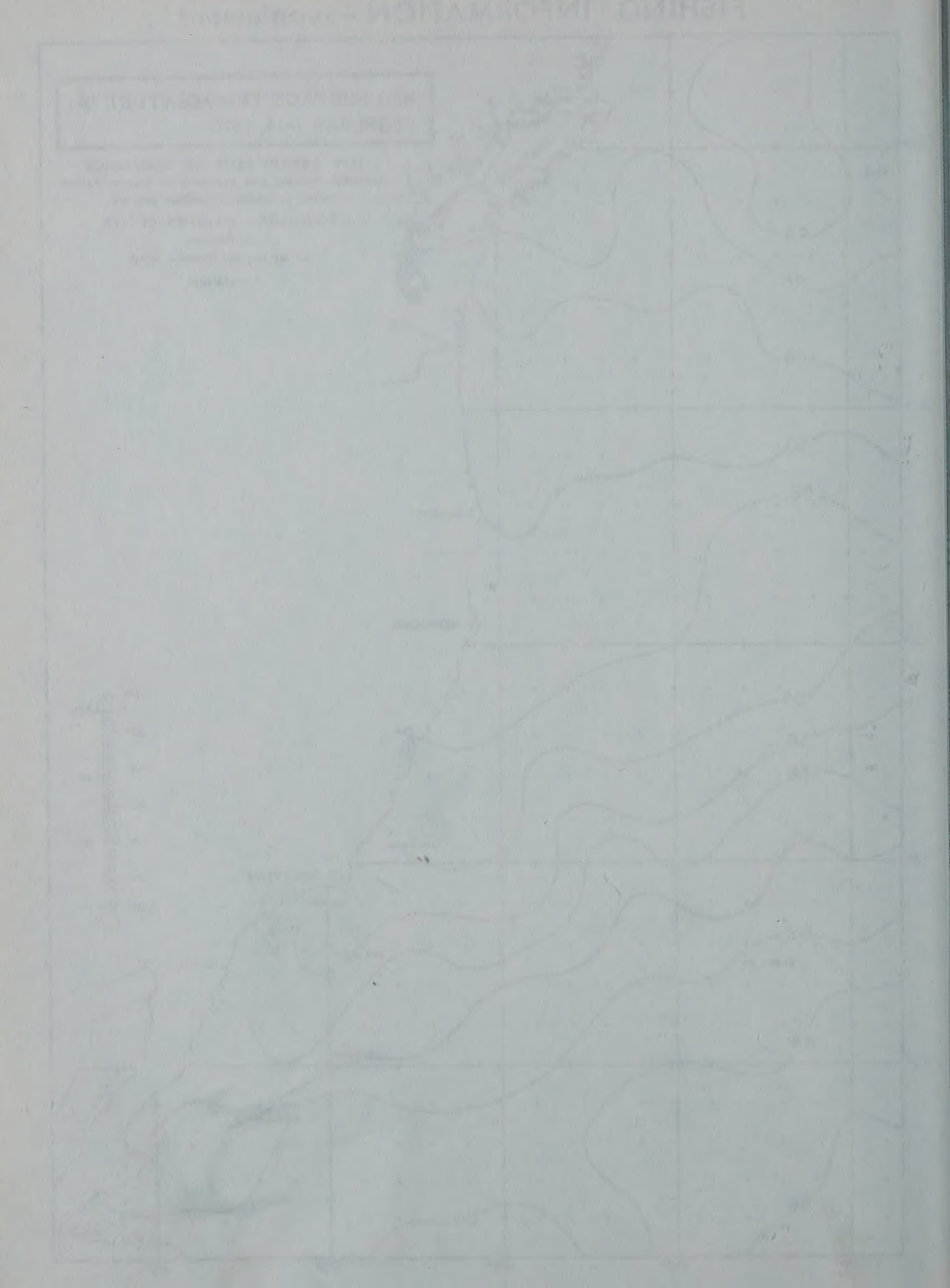
CALIFORNIAN

VOYAGE 252



FISHING INFORMATION – supplement





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